CLAIMS

1. An organic semiconductor device comprising:

at least p-type and n-type channel organic semiconductor elements each including

a pair of a source electrode and a drain electrode which are facing each other,

an organic semiconductor layer deposited between the source electrode and the drain electrode such that a channel can be formed therebetween,

a gate electrode which applies a voltage through a gate insulating layer to the organic semiconductor layer provided between the source electrode and the drain electrode;

wherein the source electrode and the drain electrode of the p-type channel organic semiconductor are made of materials having values of work function higher than those of the source electrode and the drain electrode of the n-type channel organic semiconductor respectively.

2. The organic semiconductor device according to claim 1, wherein the organic semiconductor layers of the p-type and n-type channel organic semiconductor elements are made of p-type and n-type organic semiconductors respectively.

3. The organic semiconductor device according to claim 2, wherein the source electrode and the drain electrode of the p-type channel organic semiconductor element have values equal or close

to an ionization potential of the p-type organic semiconductor layer.

4. The organic semiconductor device according to claim 3, wherein the source electrode and the drain electrode of the n-type channel organic semiconductor element have values equal or close to an electron affinity of the n-type organic semiconductor layer.

5. The organic semiconductor device according to claim 4, further comprising a wiring line which electrically connects the source or drain electrode of the p-type channel organic semiconductor element to the source or drain electrode of the n-type channel organic semiconductor element, the wiring line being made of the same material used for the source electrode or the drain electrode.

6. The organic semiconductor device according to claim 4, further comprising a wiring line which electrically connects the source or drain electrode of the p-type channel organic semiconductor element to the source or drain electrode of the n-type channel organic semiconductor element, the wiring line being made of a martial other than the same material used for the source electrode or the drain electrode.

7. The organic semiconductor device according to claim 6, wherein the martial other than the same material used for the source electrode or the drain electrode is a conductive paste.

8. The organic semiconductor device according to any one of claims 5-7, further comprising a second wiring line to be electrically connected to one of the gate electrode, the source and drain electrodes of the p-type or n-type channel organic semiconductor element at one end, the second wiring line being electrically connected to an organic electroluminescence element.